CLAIMS

1. Electric energy recovery system in a motor vehicle driven by at least one electric motor (10), of the type containing a fuel cell (14) which feeds the electric motor (10) and electrical equipment (68) and is supplied with fuel, and notably hydrogen (H_2), by means of a reformer (42), the fuel flow of which is controlled in accordance with the electricity consumption (P_{mot}^-) of the electric motor (10), and which temporarily produces excess fuel when the consumption (P_{mot}^-) of the electric motor (10) diminishes, and of the type containing energy storage means (16, 76, 78, 80),

characterized in that it consists of the following stages:

- a) a balance stage in the course of which the potential electric power (P_{pile}^+) that the fuel cell (14) is capable of instantaneously supplying is calculated in accordance with the fuel flow produced by the reformer (42) and in the course of which the electric powers instantaneously consumed (P_{mot}^-, P_{eq}^-) by the electric motor (10) and by the equipment (68) are estimated; and

- b) a stage of calculation of the excess electric power (P_{rec}) which is the result of the difference between said potential electric power (P_{pile}^+) and the sum of the estimated electric powers consumed ($P_{mot}^- + P_{eq}^-$); and

- c) a stage of determination of the instantaneous electric power storage capacity (C) of the storage means (16, 76, 78, 80) which is released when the excess electric power (P_{rec}) is strictly positive;

- d) a stage of storage which is activated when the instantaneous storage capacity (C) is higher than or equal to the excess electric power (P_{rec}), in the course of which the fuel cell (14) is supplied by all of the excess fuel and in the course of which the excess electric power (P_{rec}) is stored in the storage means (16, 76. 78. 80);

- e) a stage of distribution of the excess fuel, which is activated when the storage capacity (C) is less than the excess electric power (P_{rec}), in the course of which the fuel cell (14) is supplied with a portion of the excess fuel sufficient to reconstitute the energy stocks of the storage means (16, 76, 78, 80).

2. Method according to the foregoing claim, characterized in that it includes between calculation stage b) and determination stage c) an intermediate stage of recuperation braking b') which is activated when the electric power (P_{mot}^-) consumed by the electric motor 10 is nil, the electric motor (10) then being capable of operating as electric current generator, and in the course of which the electric power (P_{frein}) capable of being produced by the electric motor (10) is estimated and then added to said excess electric power (P_{rec}).

3. Method according to the foregoing claim, characterized in that, on storage d) and distribution e) stages, the electric power (P_{frein}) produced by the electric motor (10) is stored in the storage means (16, 76, 78, 80) in priority over the excess power ($P_{pile}^+ - P_{mot}^- - P_{eq}^-$) produced by the fuel cell (14).

4. Method according to one of the foregoing claims, characterized in that the remaining portion of said excess fuel is burned off.

5. Method according to one of Claims 1 or 2, characterized in that the remaining portion of said excess fuel is stored in a tank.

6. Method according to one of the foregoing claims, characterized in that the storage means consist of electric batteries (16).

7. Method according to one of the foregoing claims, characterized in that the storage means consist of a heat accumulator (76) in which the excess electric power (P_{rec}) is stored in the form of heat energy by means of a compression cooling system (82).

8. Method according to one of the foregoing claims, characterized in that the storage means consist of a fluid container (78, 80) in which the energy is stored in the form of mechanical energy by means of a pump (84, 86) which modifies the fluid pressure.

9. Electric energy recovery system in a motor vehicle driven by at least one electric motor (10), of the type containing a fuel cell (14) which feeds the electric motor (10) and electrical equipment (68) and is supplied with fuel, and notably hydrogen (H_2), by means of a reformer (42), the fuel flow of which is controlled in accordance with the electricity consumption (P_{mot}^-) of the electric motor (10), and which temporarily produces excess fuel when the consumption (P_{mot}^-) of the electric motor (10) diminishes, and of the type containing energy storage means (16, 76, 78, 80), characterized in that it regulates the excess recovered energy produced by the traction motor and the energy supplied by the fuel cell with the aid of the surplus reformate produced by the reformer.